

April 30, 2020



Events

Materials Chain International Conference postponed

Dear members of the Materials Chain,

due to the restrictions caused by the corona pandemic, the Materials Chain directors have decided to postpone the next Materials Chain International Conference (MCIC 2020), planned for November 25-26, 2020, until 2021.

We will get back to you as soon as more information about the conference in 2021 is available. Best regards and stay healthy,

Your Materials Chain Coordinators

Latest News

Prof. Manfred Bayer Becomes the New Rector of the TU Dortmund University

On 24 April 2020, a new Rector was elected at the TU Dortmund University: Prof. Manfred Bayer from the Faculty of Physics will succeed Rector Prof. Ursula Gather on September 1 and take over the office at the head of the university. He was previously Chairman of the Senate of the TU Dortmund University for around twelve years.

More



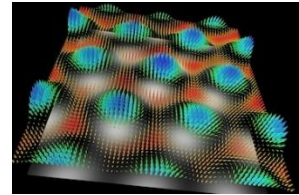
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New Type of Microscopy Developed

The duration of their momentary image is related to one second in the same way as one second to the age of the universe: Together with the Australian scientist Tim Davis and the research group of Harald Gießen (University of Stuttgart), physicists at University of Duisburg-Essen (UDE) have developed

ultrafast vector microscopy, a method of determining electric fields on surfaces with high temporal and spatial resolution.

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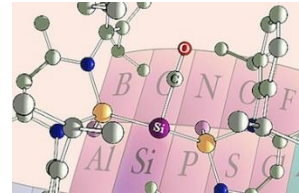


© Tim Davis

Inexpensive Alternative to Precious Metals

Carbon monoxide is used in many industrial processes where rare and expensive precious metals act as catalysts. A team of scientists from University of Duisburg-Essen (UDE) and University of Giessen has now been able to produce a carbonyl complex with the cheap semi-metal silicon for the first time. The scientific journal Nature Chemistry reports.

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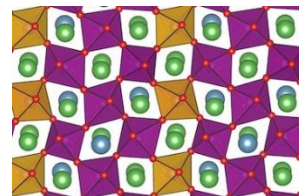


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Changing Material Properties by Stretching

Oxides are ceramics that break brittle under mechanical stress, in contrast to metals, which are easily deformable. An international team of scientists, including theoretical physicists from University of Duisburg-Essen, has now succeeded in producing membranes made of oxides that can withstand extreme tensions of up to 8 percent.

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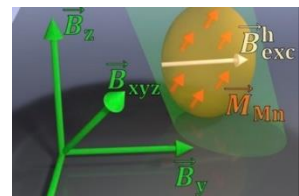


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Magnetisation by Light

Generating magnetism on demand and without electricity - in the world of doped nanocrystals this is not science fiction, but feasible. A breakthrough in this field was recently achieved by the team from the "Materials of Electrical Engineering" chair at University of Duisburg-Essen with colleagues from University of Washington in Seattle (USA). They published their results in the scientific journal "Nano Letters".

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Successor to Professor A. Heinzl Wanted

At the University of Duisburg-Essen (UDE), a university professorship for "Energy Technology" is to be filled in the Department of Mechanical and Process Engineering of the Faculty of Engineering at the earliest possible date. This is linked to the scientific management of the Centre for Fuel Cell Technology (ZBT gGmbH). Applications are accepted until 15 May.

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Ideal Reaction Chain from Model and Experiment

Sawdust, straw or grain husks can be converted as efficiently as possible into sustainable fuel using only one microorganism: Researchers from University of Duisburg-Essen (UDE) have made an important contribution to this. Their approach, consisting of experiments and theoretical simulation, supports biotechnological approaches and leads to a process that is already being used



in production by the industrial partner and has been published in the journal "Nature Communications".

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New/Coordinated Projects

Cheaper Production of Better Batteries

Approximately one third of the production costs of rechargeable batteries is caused by the phase of the first charging, in which the battery has to be conditioned. In order to make this phase more efficient and thus make battery production much more cost-effective, the consortium of the "Nano-Bat" project is developing sensors that will monitor the processes taking place in the battery. The project involves a research team from the Centre for Electrochemistry at Ruhr University Bochum (RUB) headed by Prof. Wolfgang Schuhmann.

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UDE and Leibniz Institute Establish Joint Lab

Rapid data transmission, medical examinations with harmless radiation: High-frequency technologies make it possible. Researchers at University of Duisburg-Essen (UDE) are working on the necessary semiconductor materials. In future, they will work even more closely with the Ferdinand Braun Institute, the Leibniz Institute for High Frequency Technology in Berlin (FBH). A joint laboratory has now been launched.

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Catalyst Materials that Recycle CO₂

Reuse plastic, glass and soon also CO₂: Since March, Professor Corina Andronesco and her research group from University of Duisburg-Essen (UDE) have been developing industry-relevant catalyst materials. These materials convert carbon dioxide (CO₂) into basic chemicals that serve as the basis for other products. The Federal Ministry of Education and Research is funding the project for five years with 1.4 million euros.

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Publication Highlights

An experimental and modeling study on the reactivity of extremely fuel-rich methane/dimethyl ether mixtures

Porras, S. and Kaczmarek, D. and Herzler, J. and Drost, S. and Werler, M. and Kasper, T. and Fikri, M. and Schießl, R. and Atakan, B. and Schulz, C. and Maas, U.
Combustion and Flame 212 107-122 (2020)

[more](#)

Tribological studies on multi-coated forming tools

Weikert, T. and Tremmel, S. and Stangier, D. and Tillmann, W. and Krebs, E. and Biermann, D.
Journal of Manufacturing Processes 49 141-152 (2020)

[more](#)

Image-based size analysis of agglomerated and partially sintered particles via convolutional neural networks

Frei, M. and Kruis, F.E.
Powder Technology 360 324-336 (2020)

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